THE ROLE OF COMMERCIAL COMMUNICATIONS IN NATIONAL EMERGENCY PREPAREDNESS

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THESIS

THE ROLE OF COMMERCIAL COMMUNICATIONS IN NATIONAL EMERGENCY PREPAREDNESS

by

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This thesis is a descriptive analysis of the current role played by commercial communications in the Federal Government's emergency preparedness effort. This role is defined by an examination of three principal facets of the government/communications industry interface: Specifically, the evolution of legislative authority by which the government exercises regulatory authority over communications assets, the emergency preparedness planning machinery of government, and the current governmental

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ABSTRACT

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I. INTRODUCTION

This thesis is a study of governmental management of a national resource vital to the nation's emergency preparedness - the total assets of the commercial communications industry. The U. S. Government already relies to a great degree on these assets for the accomplishment of communications missions, both military and civil.

Events of recent history have more than emphasized the need for governmental communications to be ever-increasing in their effectiveness and reliability. The Cuban Missile Crisis of 1962, the LIBERTY and PUEBLO disasters, and the recent incident involving SS MAYAQUEZ all serve as excellent examples of the need for faster, more secure, and more flexible communications for use by the National Command Authority in order to fabricate the correct response based on the most up-to-date information from the point of crisis. While these examples stress the communications need within the military sector, natural disasters and emergencies occurring within the U.S. and Territories such as flood, earthquake, typhoon, hurricane, riots, and even assasination also point out the communications need on the domestic front. Given this need, the government will most assuredly continue to increase its reliance on commercial communications systems, facilities, and technical expertise in future emergency preparedness

plans. The question that needs to be asked -and answered- is whether or not these plans allow for the maximum and most efficient mobilization and utilization of these assets within the much reduced time span inherent in crisis or emergency situations.

A. OVERVIEW

Emergency powers are granted to officials and agencies of government by enacted laws. In order to ensure the necessary mobilization of the nation's resources in times of emergency, Congress has passed legislation involving almost every conceivable resource, including communications resources. In attempting a definition of the role played by commercial communications in national emergency preparedness, it is first necessary to examine the legal basis for governmental actions in this area. Once authority has been established, the planning agencies and organizations can construct the detailed preparedness plans and establish the necessary roles, responsibilities, and organizational structure to cope with emergency situations. These planning agencies are examined as to their overall responsibilities in the total planning effort and as to their specific impact in communications planning. The final major portion of this study concerns the present governmental dependency on commercial assets, specifically telecommunications, satellite communications, and broadcast assets, and a summary of the present scope of the U.S. communications industry.

B. PURPOSE

The primary intent and purpose of this thesis is to point out what appears to be a serious lack of current and relevant legislation, planning and policy organization, and simple but effective emergency plans to bring about the complete and rapid mobilization and utilization of commercial communications assets during emergency or crisis situations. This need is underscored by a presentation of the present high reliance by government on commercial assets and the tremendous size and potential of the industry as it now exists. By defining the role played by the commercial carriers in national preparedness as presently defined by law and by government planners, it is intended that ways to improve that role can be recommended.

II. APPROACH

The definition of the role of commercial communications in national emergency preparedness can only emerge by a careful examination of (1), the legal tools available to the government in order to effect mobilization of commercial communications resources during periods of crisis or emergency, (2), the emergency preparedness planning agencies of government and the role they envision for commercial assets, and (3), the extent to which the government now depends on these assets and the availability of additional assets for expanded utilization.

It is not possible to accurately establish the role of these commercial resources in the emergency preparedness area by a simple quantifying process of totaling equipments, circuit miles of wire and cable, satellite channels, etc. available to the government for emergency use. This role only begins to take definitive form when viewed within the total perspective as outlined above.

A. ESTABLISHING GOVERNMENTAL AUTHORITY OVER COMMUNICATIONS RESOURCES

"Traditionally, government has viewed telecommunications primarily as a mission-support function, rather than a focus for public policy. The result has been that policy has evolved as a patch-work of limited, largely ad hoc responses to specific issues, rather than a cohesive framework for planning. Government organization for the

formulation and implementation of communications policies reflects this evolution."

[Ref. 3, Chap. 9, p. 2]

1. Background

The exercise of governmental authority and control over vital assets of the nation during periods of national emergency is not a new concept. Communications assets have been no exception. At the very beginning of what subsequently has developed into a multi-billion dollar industry in the U.S. congressional watchdogs were on hand in 1844 when the first sending and receiving of messages over a commercial telegraph wire was accomplished [Ref. 1, p. 51]. From that humble beginning point there have been a series of controlling and regulating laws enacted ranging from simple taxations to broad war powers acts dealing with the government/commercial communications industry relationship. The tremendous potential of the fast and reliable communications made possible by the telegraph in 1844, the telephone in 1876, and radio in 1901 was immediately evident to government planners, especially the military planners. It was inevitable from the onset that the Federal Government would seek to exercise various forms of control over the new industry and especially to ensure its full utilization as a national resource in times of crisis, either international or domestic.

Perhaps the earliest significant piece of legislation dealing with commercial communications was the MANN-ELKINS ACT of 1910.

The act was instrumental in establishing two fundamentals which have persisted to the present day in terms of federal involvement with commercial communications. First, the law established that the growing telephone and telegraph industry was, in fact, a commerce, or commodity, and second, that it was necessary and correct that it be subjected to governmental regulation. The law placed the industry under the jurisdiction of the Interstate Commerce Commission.

Closely following the MANN-ELKINS ACT came the RADIO ACT of 1912, which responded to the recognized need to set aside certain radio frequencies for strictly government usage. This law was amended and added to in 1922 and 1927 resulting in the formation of the Interdepartment Radio Advisory Committee (IRAC) and the Federal Radio Commission (FRC). The tremendous growth of communications in the 10 year period 1917 to 1927 spawned the need for these bodies. IRAC, composed of representatives from all federal agencies using radio communications, was tasked with the allocation of frequencies so as to avoid interference among government users. The FRC initiated the government's entry into the licensing and regulatory practices that was to ultimately lead to the present high degree of governmental control over commercial communications.

The epitome of national emergency is, of course, war. With the coming of World War I the Congress acted to provide the President with the necessary powers to commit commercial communications

resources to federal use. The OVERMAN ACT of 1918 designated to the President broad powers for the duration of the war, including the powers to nationalize industries vital to the country's war effort. In fact, during World War I the government actually took over complete control of the nation's telecommunications and placed them under the management control of the Postmaster General [Ref. 2, p. 156].

2. The Federal Communications Act of 1934

The significance of this act lies in its creation of a permanent commission, responsible to the Congress, with regulatory powers over commercial communications to include those previously granted to the IRAC and the FRC in prior legislation and with additional powers as well. This commission was the Federal Communications Commission (FCC). The act, with subsequent amendments, empowered the FCC with regulatory controls to include:

1. Telephone and telegraph companies that provide services to the public;

2. The allocation of frequencies to radio and TV services, and to individual stations;

3. Authorizing and licensing radio and TV transmitters;

4. Licensing operators of radio and TV transmitters;

5. The protection of life and property through the use of telecommunications;

6. The participation in formulating U.S. policy for international agreements concerning communications;

7. The coordination of all forms of electrical communications with the national defense effort. [Ref. 1, p. 52].

Title VI of the act provides that "during the continuance of a war in which the United States is involved or upon proclamation by the President that war or threat of war, a state of public peril or disaster, or other national emergency exists, special powers are conferred upon the President in connection with communications." [Ref. 2, p. 53].

Although this legislation was considered to be rather sweeping in scope for the state of communications as they existed in the mid-1930's, it nevertheless possessed inherent shortcomings which were to become evident in the future. The most important failure of the act was in its lack of recognition of the total federal involvement with the communications resources other than those assigned to the FCC. Specifically, no agency was created to administer the use of the frequency spectrum, or to coordinate research and development, or to procure communications equipment and services for use by the government. Also, there was no person or agency designated to act or function as the main focal point for the President in the communications field. [Ref. 3, Chap. 9, p. 5-6].

3. World War II Communications Control Boards

Government control and utilization of commercial communications during World War II was accomplished primarily by the use of wartime boards and committees created by executive order using

existing or war powers legislation as authority. After the initiation of hostilities in Europe but before the disaster at Pearl Harbor in 1941 the government moved to place the nation's communications resources at the disposal of war preparedness planners. In 1940 the Defense Communications Board was established and tasked with making necessary plans for efficient use and control of radio, wire, and cable communications in order to meet national defense requirements. [Ref. 2, p. 156]. It was renamed the Board of War Communications in 1942. The Chairman of the FCC was selected to serve as the chairman of this new board and representatives from the Departments of the Army, Navy, State, and Treasury made up the Board's working members. The Board was assisted in carrying out its duties by 5 main advisory committees consisting of a Coordinating Committee, Law Committee, International Broadcasting Committee, Labor Advisory Committee, and the Industry Advisory Committee. A total of 13 smaller planning committees also assisted and were made up of persons recruited from both government and the communications industry.

The War Production Board and the Office of War Utilities also played a major part in the wartime regulations of the communications industry. Early in the war the control of the manufacturing facilities, equipment, and material necessary for the expansion of commercial communications gradually shifted from the former to the latter's control. Two working Divisions were formed within the Office of War

Utilities to manage the available communications assets in order to meet government war requirements. The Communications Division was responsible in the wire and cable area and the Radio and Radar Division directed the radio and electronics effort.

The need for actual government "takeover" of the communications industry during the war never occurred due largely to the "strength and responsiveness of the industry." [Ref. 2, p. 157]. Immediately after the end of the war, the emergency legislation which authorized the formation of these various control boards was repealed and normal peacetime regulatory functions passed back to the responsible agencies of government as delineated by the Federal Communications Act.

4. The National Security Act of 1947

The National Security Act of 1947 was to have a far-reaching impact on the commercial communications industry. The act was essentially a reorganization of the nation's military establishment, creating a single Department of Defense out of what had been the Departments of the Navy, Army, and War. The establishment of the Air Force as a separate and distinct armed service was also included. This newly formed department was immense by all parameters of measurement. It is, in fact, the largest department of the government and in the world [Ref. 4, p. 215]. Along with the establishment of the parent department came a multitude of defense agencies, one of which, the Defense Communications Agency (DCA) was destined to become the largest single customer and user of commercial communications.

Another of the agencies brought about by this act was the National Security Resources Board. This planning organization was to see several name changes over the years before finally appearing under its present title of the Federal Preparedness Agency (FPA). With the formation of this agency the President now had an organization whose purpose was to advise and assist him in the necessary planning for meeting national emergency situations on a permanent and continuing basis.

5. The Communications Satellite Act of 1962

In 1956 the Soviet Union placed in orbit around the earth a basketball-sized satellite that essentially took the world into the Space Age. Although the Soviet achievement of placing a man-made object in space thrilled -and shocked- the world, it was the steady "beep, beep" of the tones eminating from the Sputnik that confirmed what communications experts had known for years; namely, that a satellite configured for purely communications functions could provide the world with a communications potential of great magnitude and flexibility, with utility in many diverse fields, both military and domestic.

After six years and intense governmental effort and expenditures the U.S. effort in space was at a point of development to support programs aimed at deriving tangible benefits from space technology. One of these programs was the orbiting of communications satellites. The Communications Satellite Act of 1962 proclaimed as national policy

the effort to "establish, in conjunction and in cooperation with other countries, as expeditiously as practicable a commercial communications network, which will be responsive to public needs and national objectives, which will serve the communications needs of the United States and other countries, and which will contribute to world peace and understanding." [Ref. 5, p. 4]. The next year Congress formed the Communications Satellite Corporation (COMSAT) as the U.S.'s entry into the International Telecommunications Satellite Organization (INTELSAT). Congress also stipuated that 50% of COMSAT's Board of Directors was to be drawn from the commercial carriers, thus ensuring from the beginning the involvement of the commercial communications industry's expertise, technical and managerial ability, and money. [Ref. 5, p. 4].

The authority of the FCC to regulate this new form of communications was quickly established as the entry into the field by the commercial carriers became a legislated reality after COMSAT was formed.

6. Executive Orders of 1963 and 1970

Citing previously enacted legislation, primarily the Federal Communications Act of 1934 and the National Security Act of 1947, Presidents Kennedy and Nixon made substantial reorganizations of the existing governmental communications policy, planning, and managerial structure.

In the Executive Order of 21 August, 1963, President Kennedy established the National Communications System (NCS) with the stated objective as follows:

"The objective of the NCS will be to provide necessary communications for the Federal Government under all conditions ranging from a normal situation to national emergencies and international crises including nuclear attack."

The Executive Order signed by President Nixon on 1 July, 1970, established within the Executive Office of the President a new Office of Telecommunications Policy (OTP) which assumed policy direction authority for the NCS independent of the Office of Emergency Preparedness, now the FPA.

These executive orders effected important changes in the government's organization involving communications. They were viewed by the two Presidents initiating them as essential in order to meet the increasing demands for more responsive communications, especially during crisis and/or emergency. The fact that the changes were brought about by executive order using legislation as authority that was no longer responsive to the needs of government gives evidence to the ever-increasing gap between communications demand and the legislative measures presently utilized to ensure their availability.

B. EMERGENCY PREPAREDNESS PLANNING INVOLVING COMMERCIAL COMMUNICATIONS

Virtually all government agencies, bureaus, offices, and

departments are users of communications in some form. The larger departments such as Defense, State, Treasury, and Interior operate their own systems, while the smaller agencies must depend on services provided by designated larger organizations or provided by the Government Services Administration (GSA). All, both large and small, rely mainly on commercial communications services and equipment to fulfill their respective communications needs. The responsibility for providing the necessary planning to ensure that the government's demand for communications is met is spread over a number of organizations. Some are involved primarily with procurement, while others are concerned with management or regulation. In the following section the principal policy-making and planning agencies of government involving commercial communications in emergency preparedness will be examined.

1. The Federal Preparedness Agency (FPA)

Prior to the executive order creating the Office of Telecommunications Policy the planning functions regarding communications within the NCS were the responsibility of the Director of Telecommunications Management in the Office of Emergency Preparedness, now the FPA. The advisory and planning functions for telecommunications now rest in that office. The FPA now serves primarily as the federal coordinator for emergency preparedness planning, consolidating the various inputs from other governmental planning agencies and

interfacing them with State and Local Governments and with the private sectors of industry, labor, and agriculture.

Whereas the responsibilities of the FPA include the requirement for natural disaster planning, the primary effort is in the preparation and response to "any threat to the national security which must be supported by an informed citizenry and a vigorous and expanding economy." [Ref. 6, p. v.].

a. The National Plan for Emergency Preparedness

An examination of this plan reveals that it is not a detailed guide or directive which outlines clear and concise measures to be taken. It is instead a broad overview of emergency preparedness intended for use by Federal, State, and Local Governments as a starting point for their own more detailed preparedness planning. The preface states that the Plan "sets forth the basic principles, policies, responsibilities, preparations, and responses of civil government to meet any kind of national emergency." [Ref. 6, p. v.].

The Plan deals with elements of emergency preparedness such as manpower, transportation, food, water, fuel, energy, telecommunications, etc. The opening chapter delineates some of the basic principles of preparedness planning such as the defining of the threat, attack and post-attack, basic policy objectives, and methods of attainment.

The section concerning telecommunications is divided into four main subsections: objectives, responsibilities, policies, and

plans. The role of commercial communications is alluded to in each of these subsections, both by direct and indirect reference, albeit most often in broad terms. Specifically, commercial communications, or the communications industry as a whole, are to:

1. Provide a broadcast capability for the use of government to inform, direct, and advise the public.
2. Provide for emergency management of telecommunications resources, including the restoration and rehabilitation of the industry after the emergency.
3. Provide data for accurate damage assessment.
4. Provide for technical compatibility among all commercial systems.
5. Provide for emergency planning on an individual carrier or company basis in conformance with federal plans and objectives.
6. Prepare for total regulation and/or utilization by the government should the nature of the emergency so dictate. [Ref. 6, p. 55-56].

The Plan does not provide for reports, checks, or inspections so as to monitor how and to what extent the above responsibilities are, or are not, being accomplished.

2. The National Communications System (NCS)

The establishment of the NCS in 1963 was an attempt to reorganize the existing telecommunications of the Federal Government

into a more efficient and responsive system. The NCS was designed to be a combination of the communications assets of the major, and some minor, departments and agencies possessing substantial telecommunications capabilities. The major contributors to the system are the Departments of Defense, State, the National Aeronautics and Space Administration (NASA), the Government Services Administration (GSA), and the Federal Aviation Administration (FAA). Minor contributors consist of the U.S. Information Agency (USIA), the Department of Commerce, the Department of the Interior, and the Energy Research and Development Administration (ERDA).

The management of the NCS rests with an appointed Manager, usually, a military officer of three-star rank (LTGEN. or VADM), who also serves ad the Director, Defense Communication Agency. The Secretary of Defense serves as the President's Executive Agent for the NCS as specified in the establishing Executive Order. The Director, Office of Telecommunications Policy functions as Presidential advisor and policy director for the NCS. The NCS organizational chart is shown in figure #1.

Emergency preparedness planning regarding the NCS rests within the office of the Manager. He is assisted in this effort by a staff comprised of representatives from the contributing departments and agencies.

The basic planning document for emergency preparedness within NCS is the NCS Plan for Communications Support in Emergencies

NCS ORGANIZATION CHART [Ref. 8]

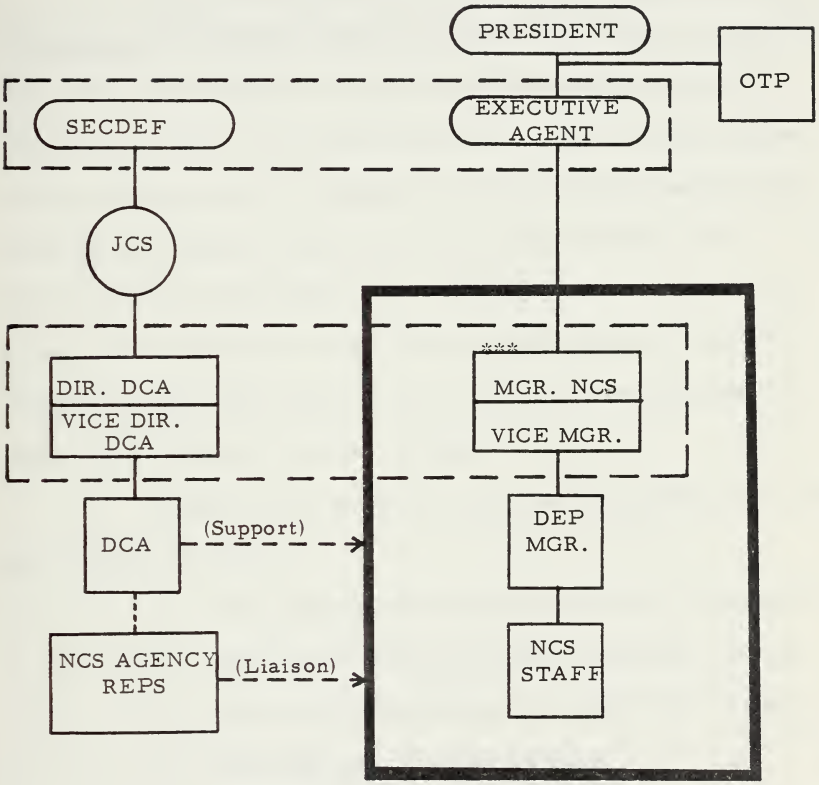

Figure 1.

and Major Disasters.

a. NCS Plan for Communications Support in Emergencies and Major Disasters.

This planning document is similar to the National Plan for Emergency Preparedness in that it is primarily an outline of responsibilities, roles, and missions relating to pre-disaster planning for communications support. The scope of this plan is the providing of guidance to NCS member-agencies involved in providing communications support to the Federal Disaster Assistance Administrator (FDAA). [Ref. 9, p. 1] Thus, the thrust of the plan is directed toward those emergencies and major disasters defined by Public Law 93-288 as "flood, earthquake, tornado, drought, tidal wave, etc., etc." as opposed to emergencies posing a direct threat to national security.

Specific involvement of commercial communications in this plan include the following:

1. The assigning of representatives by the appropriate commercial carriers to assist the Federal Disaster Communications Coordinator (FDCC) when required.
2. Participation in disaster planning.
3. Deployment of commercial communications personnel to disaster areas when required.
4. The development of emergency procedures and policies to effect rapid service restoral.

It is also noted in the plan that some commercial carriers have in effect a 24-hour emergency operations center to manage and direct restoral efforts. [Ref. 9, p. 7]

b. The Defense Communications Agency

The DCA is the primary management organization of the Defense Communications System (DCS), which consists of the communications system and networks of the DOD, the major contributor to the NCS. Plans and policy relating to commercial communications within the DCS are the responsibility of the Commercial Communications Policy Office in the DCA Headquarters. (See Figure #2).

The DCA/commercial communications interface for the procurement of commercial communications rests in the Defense Commercial Communications Office (DECCO), a field activity of the DCA charged with the leasing of private line circuits to meet DOD requirements. The main field office is located at Scott Air Force Base, Illinois, with sub-offices in Honolulu, Hawaii, (DECCO-PAC), Sembach, West Germany, (DECCO-EUR), and Elmendorff, Alaska, (DECCO-ALASKA), for the leasing responsibilities in those areas. DECCO also leases the commercial circuit requirements for other government agencies when required. [Ref. 10, p. 24].

3. The Office of Telecommunications Policy

The Executive Order of 1970 establishing the OTP assigned general functions to the Director, OTP, which impact on the role of

DCA ORGANIZATION [Ref. 10]

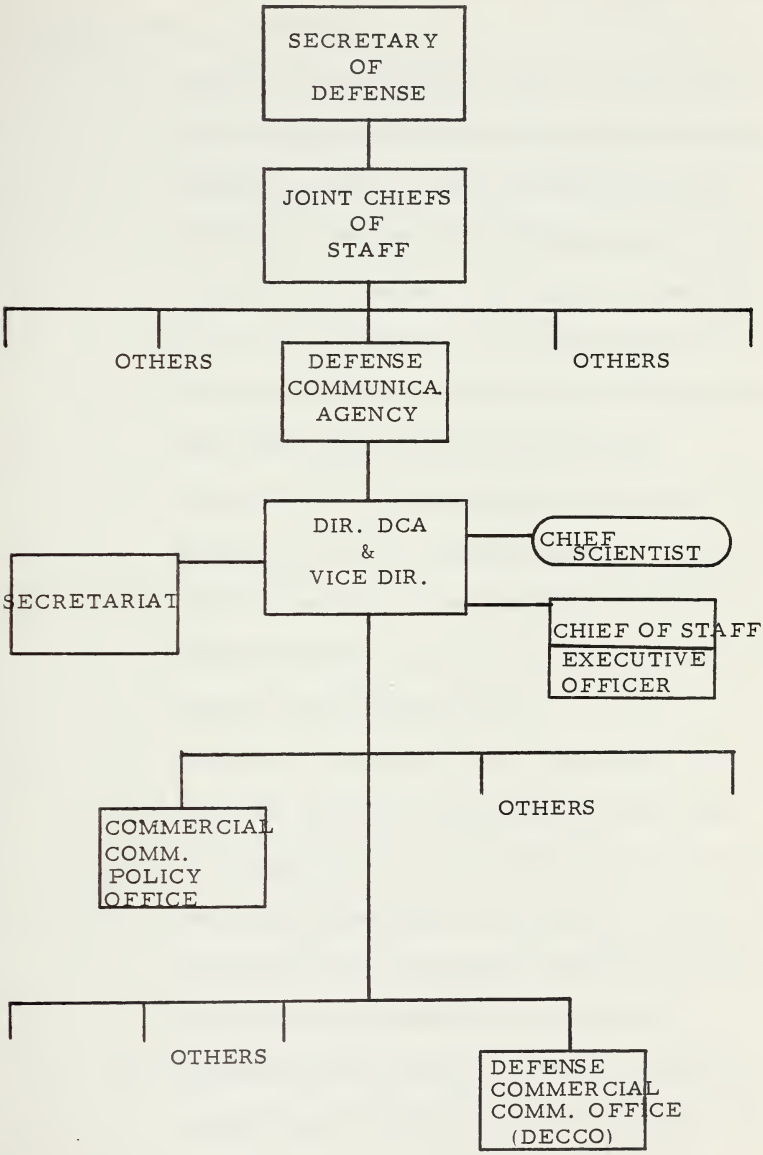

Figure 2

commercial communications in the preparedness effort. Specifically, the Director, OTP, is directed to:

1. Develop and set forth plans, policy, and programs with respect to telecommunications that will promote the public interest, support the national security, sustain and contribute to the full development of the economy and world trade, strengthen the position of the U.S. in negotiations with foreign nations, and promote effective and innovative use of telecommunications technology, resources, and services.
2. Coordinate the telecommunications activities of the executive branch and formulate policies and standards therefor, including but not limited to considerations of interoperability, privacy, security, spectrum use, and emergency preparedness.
3. Evaluate by appropriate means, including suitable tests, the capability of existing and planned telecommunications systems to meet national security and emergency preparedness requirements, and report the results and any recommended remedial actions to the President and the National Security Council.
4. Review telecommunications research and development, system improvement and expansion programs, and

programs for testing, operation, and the use of telecommunications systems by the Federal agencies.

5. Coordinate the development of policy, plans, programs, and standards for the mobilization and use of the Nation's telecommunications resources in any emergency, and be prepared to administer the resources in any emergency under the overall policy direction and planning assumptions of the Director of Emergency Preparedness. (Note: Now the Federal Preparedness Agency). [Ref. 11]

As evident by these specified functions it is the Director, OTP, who is charged with the development of plans, policy, and programs involving mobilization and utilization of communications resources to meet crisis or emergencies. In meeting its responsibilities OTP has shaped the emergency preparedness planning effort toward compliance with three basic principles:

1. The provision for common use of facilities for both routine and emergency operations.
2. Balance attainment between the survivability of communications systems and the durability of the facilities and/or systems they support.
3. In order to ensure maximum efficiency during emergencies, responsibilities must be clearly defined and delegated. [Ref. 12, p. 15].

Although the above planning requirements impact directly on the communications assets of the NCS under the auspices of OTP, the issuance in 1974 of Policy Circular No. 13 entitled Federal Use of Commercial Telecommunications Services emphasized the long-standing national policy of reliance by the Federal Government on the communications industry for services and equipments, and clarifies the assumption of commercial communications involvement in OTP plans and policy. [Ref. 12, p. 11]

4. The Federal Communications Commission (FCC)

The FCC, being the primary agency of government for control and regulation of commercial communications assets, also plays an important role in the emergency preparedness planning effort and consequently is instrumental in formulating the commensurate role of commercial communications.

Preparedness planning functions assigned to the FCC include the following:

1. Control of electromagnetic radiation.
2. The issuance of advice and guidance for the protection of essential communications facilities.
3. Damage assessment.
4. Conservation and salvage of communications equipment.
5. Restoral of services after attack or other emergency or disaster.

6. The establishment of priority systems for emergency communications.

7. The conduct of appropriate research and development. [Ref. 2, p. 158]

Responsibility within the FCC for emergency preparedness is assumed by a FCC Commissioner who heads the Office of Plans and Policy. The FCC also has primary responsibility for the development, operation, regulation, and testing of the national Emergency Broadcasting System (EBS).

a. National Industry Advisory Committee (NIAC)

Within the FCC the NIAC is tasked with the responsibility for preparing emergency plans and procedures involving the communications industry on national, state, regional, and local levels. There are 8 regional committees which coordinate with the parent committee. State committees function at the state and local levels with industry representatives. Altogether there are approximately 500 industry advisory committees which directly supervise emergency systems and procedures. [Ref. 18, p. 122-125].

5. General Services Administration (GSA)

Established in 1949, the GSA was to provide the government with an efficient administration of property and records, and with the management of certain public utilities and communications services not involving operational programs. Efficient procurement and utilization were to be the goal. As a result of a critical report submitted by the

Comptroller General in 1959 concerning the continuing lack of communications coordination between governmental agencies and the serious incompatibility of communications equipment and procedures, the GSA was forced into the operational role of providing communications services to other government departments and agencies through the establishment of the Federal Telecommunications System (FTS). [Ref. 2, p. 85].

a. The Federal Telecommunications System (FTS)

The FTS is one of the primary elements of the NCS. Control of the system is exercised by the Office of Telecommunications Operations in the GSA's Transportation and Communications Service. Other functions include liaison with commercial carriers, training, and coordination concerning communications security with the National Security Agency. The FTS is a complex of leased commercial circuits, facilities, equipment, and services which link together governmental users of telecommunications. [Ref. 2, p. 85].

By Executive Order 11093 of 26 February, 1963, the Administrator, GSA, was directed to plan for, provide, operate, and maintain appropriate telecommunications facilities to meet government needs, in consonance with NCS standards and procedures.

C. TELECOMMUNICATIONS AS A NATURAL RESOURCE

"The term 'telecommunications' as commonly understood, refers to any transmission, emission, or reception of signs, signals, writings, images, and sounds or intelligence of any nature by wire, radio, visual,

or other electromagnetic systems. Communications may be on a point-to-point basis, that is, from one particular geographical location directly to another, or they may be transmissions intended for the general public such as those broadcast by standard broadcast and television stations." [Ref. 2, p. 63].

Over the past 30 years the growth of the resources within the U.S. that fit into the above definition has been enormous. As part of the process for defining the role of commercial communications in emergency preparedness it is necessary to obtain a grasp of the extent to which these communications assets have become a major resource on which the government can rely and depend.

1. Telephone and Telegraph Resources

FCC statistics available at the beginning of 1974 indicated that there were over 1700 land-line telephone companies in the U.S. with a plant book value of over $84 billion and employing over 950,000 persons. Of these the top 61 responsible for reporting to the FCC accounted for 90% of the industry's revenues. [Ref. 13, p. 287]. The number of telephones in the U.S. account for almost one-half of the world's total. (See figure 3).

Growth of the telephone industry has been steady and consistent, averaging about 4-5% increase a year in the total number of operating telephones. Plant investment and operating revenues have also climbed steadily as shown by the graphical representation in figure 4.

COMMUNICATIONS INDUSTRY DATA AS OF 1974

COMMON CARRIERS: [Ref. 14, p. 210-211]

TELEPHONES - 138.7 Million. (45% of the world's total)

Largest company operates 114 million.

1,697 Smaller companies operate 24.8 million

Gross plant investment, $93.4 million.

TELEGRAPH - Public offices - 5,745,000

Miles of telegraph channel - 19.2 million.

Gross plant investment - $1.3 billion

COMMUNICATIONS SATELLITES

YEAR	1965	1967	1968	1971	1974
Satellite Weight	85 lbs	190 lbs	332 lbs	1585 lbs	1600 lbs (approx.)
No. of Circuits (Avg)	240 (1 TV)	240 (1 TV)	1200 (4 TV)	5000 (12 TV)	14,400 (24 TV)
Design Lifetime	1.5yrs	3 yrs	5 yrs	7 yrs	7 yrs

Figure 3

Within the industry the American Telephone and Telegraph Corporation, encompassing the nation-wide Bell System, is by far the giant of the industry, possessing over 80% of the Nation's telephone market.

Domestic telegraph service is practically the domain of the Western Union Telegraph Company, with nation-wide service and a plant investment in the U.S. alone approaching $1.5 billion. (See figure 3). Growth of this company has also been steady over the years as can be traced in the graph of plant investment and operating data as shown in figure 5. In addition to the Western Union Telegraph Company there are 6 overseas telegraph carriers involved in telecommunications commerce within the U.S. The combined employment of these six companies plus Western Union is approximately 25,000 persons. [Ref. 13, p. 288-289]. Western Union also operates two Network Management Centers in New Jersey and McLean, Virginia, which effect overall control and coordination for the entire Western Union communications network. [Ref. 17, p. 70].

a. The Other Common Carriers (OCC)

Apart from the extensive assets of A. T. &T. and the Western Union Company there are also a number of smaller, more specialized carriers involved in all forms of telecommunications service, but often serving only localized areas and offering only customer-directed services. These carriers are known within the industry as the "other common carriers", or simply the OCC's.

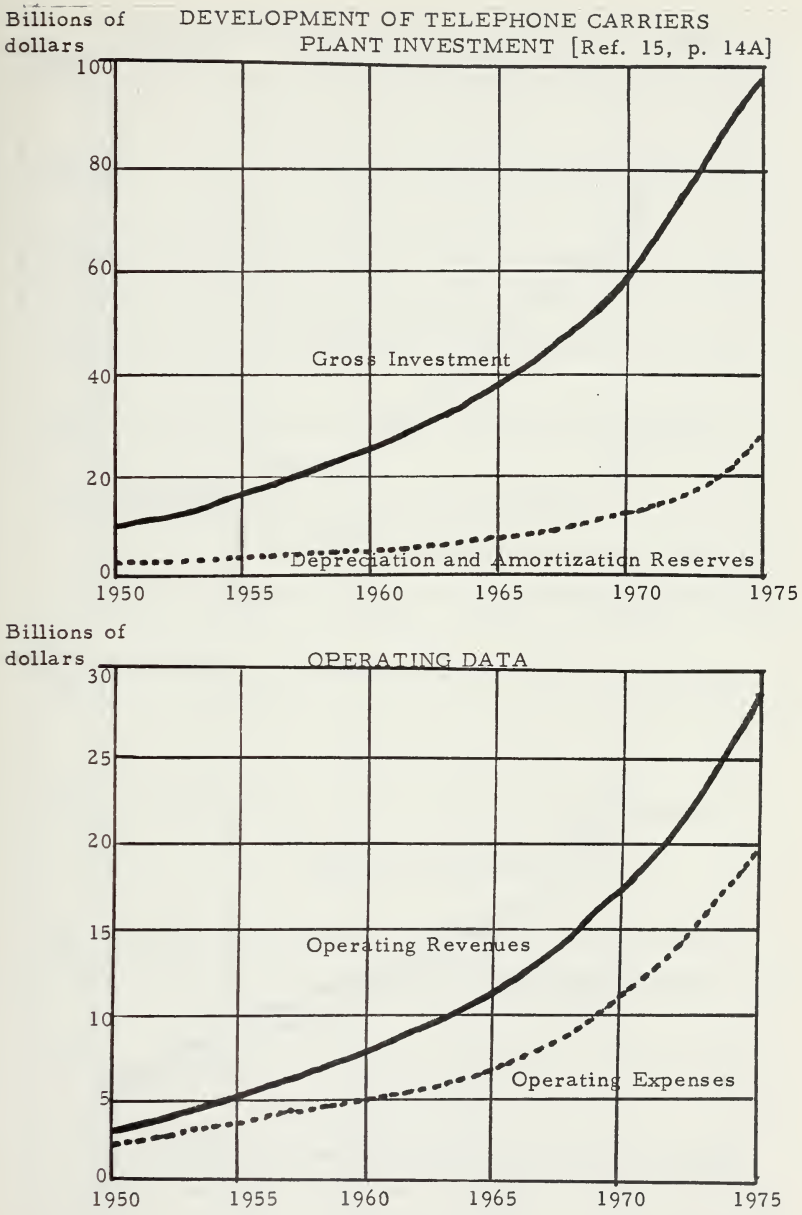
Billions of dollars
DEVELOPMENT OF TELEPHONE CARRIERS
PLANT INVESTMENT [Ref. 15, p. 14A]
100
80
60
40
20
0
Gross Investment
Depreciation and Amortization Reserves
1950
1955
1960
1965
1970
1975
Billions of dollars
OPERATING DATA
30
25
20
15
10
5
0
Operating Revenues
Operating Expenses
1950
1955
1960
1965
1970
1975

Figure 4

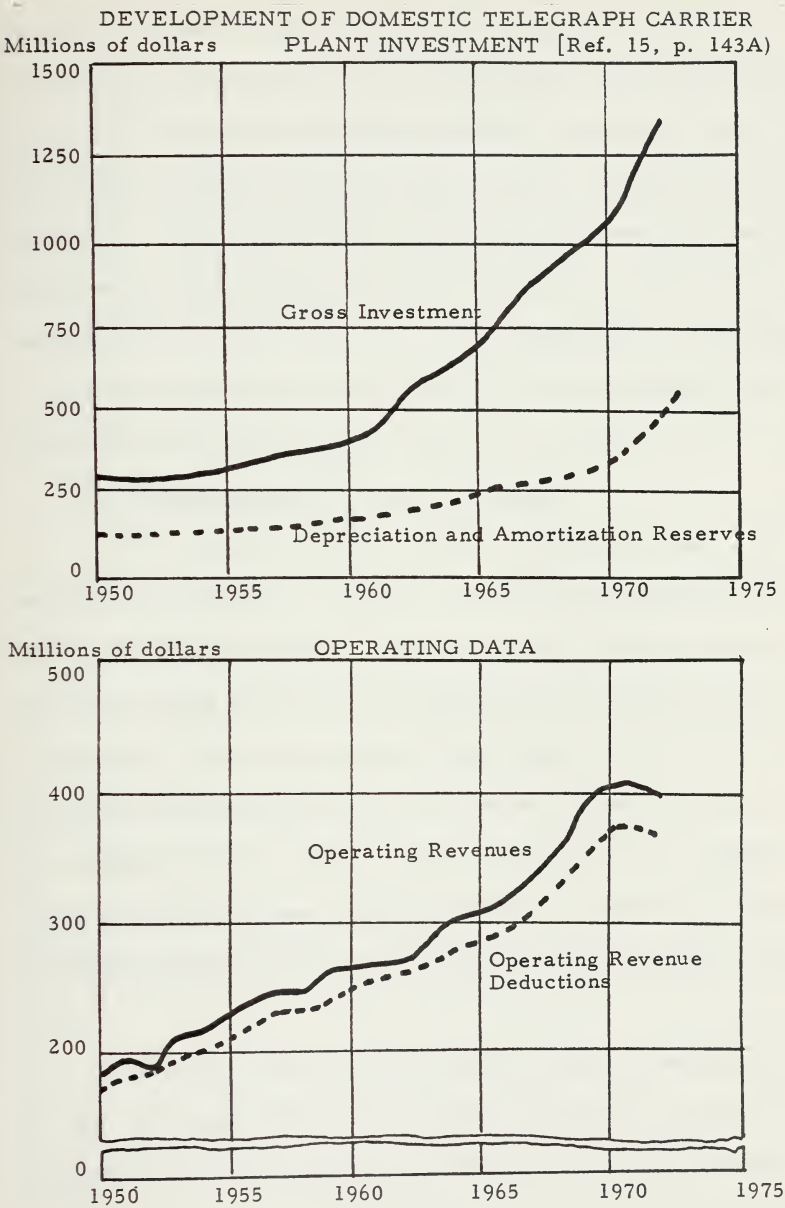
DEVELOPMENT OF DOMESTIC TELEGRAPH CARRIER
PLANT INVESTMENT [Ref. 15, p. 143A)
Millions of dollars
1500
1250
1000
750
500
250
0
Gross Investment
Depreciation and Amortization Reserves
1950
1955
1960
1965
1970
1975
Millions of dollars
OPERATING DATA
500
400
300
200
0
Operating Revenues
Operating Revenue Deductions
1950
1955
1960
1965
1970
1975

Figure 5

A typical sampling of their services and coverage is shown in figure 6. The OCC's at the present time are concentrating in the data transmission field and are operating primarily in the major population centers of the U.S. Although the OCC's do not in any way pose a threat to the preeminence of the large domestic carriers, nevertheless their resources are growing and now represent sizable assets which could be used effectively in emergency situations. It is estimated that OCC facilities could handle approximately 15% of the Federal Government's present requirement for leased circuits. [Ref. 16, p. 3-10].

2. Commercial Satellite Communications

As a result of the FCC ruling No. 16495 of 16 June, 1972, entitled "Establishment of Domestic Communications-Satellite Facilities by Non-Government Entities", applications from commercial enterprises were filed which ultimately resulted in several satellite systems in operation. Five major domestic corporations are now involved in providing communications service to government and public customers via satellite systems. These include COMSAT/A.T.&T., Western Union Telegraph Company, American Satellite Corporation, General Telephone and Electronics, and RCA Global Communications. [Ref. 5, p. 7].

Since the launch of the first purely communications satellite in 1965, the "Early Bird", the increasing technology and potential for expanded services and profit have produced ever larger and more

OTHER COMMON CARRIERS

[Ref. 16, p. 3-7]

	Coverage	Services
Specialized Common Carriers		
. MCl Telecommunications	Coast-to-coast, 33 metropolitan areas	Range of analog dedicated channels, in charging increments of 1 to 240 VE channels
. Southern Pacific Communications	Coast-to-coast, 41 metropolitan areas	Range of analog dedicated channels, in charging increments of 1 to 240 VE channels
. Data Transmission Co. (DATRAN)	Coast-to-coast, 38 metropolitan areas	Digital data private lines 2400, 4800, 9600 bps), circuit switched data service
. Western Tele-Communications	SCC facilities between L.A. and Arizona, video microwave in Western mountain states	Inactive as SCC commercial service vendor
. CPI Microwave	Cities in Texas	Analog dedicated channels
Domestic Satellite Carriers		
. Western Union Telegraph	Two 12-transponder satellites, five earth stations	Analog VE dedicated channels in charging increments up to 300; wideband;full transponder services
. RCA Global Communication	One WUT transponder leased; two earth stations(east and west coast)	Analog VE dedicated channels in charging increments up to 60 channels; high speed data service

Figure 6

Domestic Satellite Carriers (continued)		
. American Satellite	Three WUT transponders leased; three common-user earth stations; five dedicated-use earth stations (DCA)	Analog VE dedicated channels in charging increments up to 60 channels; high speed data service
Value Added Networks		
. Telenet Communications	Network access in 16 metropolitan areas (east, west, midwest)	Packet switched data service of 110-300 bps, 600 bps, 2400-56000 bps
. Graphnet	Nationwide In-WATS, TWX/Telex and Out-WATS, with 43 destination cities in tariff	Message switched facsimile service

Figure 6

capable systems. (See figure 3). The assets which compose these systems fall into three distinct categories: The satellites, earth stations for transmitting and receiving, and the ground interface with existing communications networks. A summary of the satellite communications industry by individual commercial enterprise follows.

a. COMSAT/A.T.&T./G.T.&E.

COMSAT and A.T.&T. propelled the U.S. into the communications satellite field with the INTELSAT series satellites as the U.S. contribution into the International Satellite System (INTELSAT). There are approximately 70 countries participating in the global system. At the present time most international communications and about 2/3 of all transoceanic communications from the U.S. are carried by this system. [Ref. 17, p. 62]. The new series INTELSAT-IVa satellites will go into orbit this year as well as the new COMSTAR Satellite, a joint venture of A.T.&T. and G.T.&E. for purely domestic use. Also scheduled for operation in 1976 will be the Maritime Satellite System (MARISAT) for mobile maritime platforms, making possible high quality voice and data service to ships at sea. [Ref. 17, p. 62]. These systems will make use of present earth station terminals operated by COMSAT and will be integrated into the existing Bell System ground network for overall system efficiency and flexibility. With 134 available satellite circuits presently operating in the Pacific area alone, and with the addition of MARISAT and COMSTAR systems, the total

satellite communications assets of these corporations represent a significant communications resource for emergency use.

b. American Satellite Corporation (ASC)

ASC operates under FCC regulation as a domestic satellite communications carrier offering services between 25 major cities in the U.S. The ASC system is composed of 13 operational earth terminals across the country with additional terminals under construction. While ASC is presently utilizing WESTAR I and II satellites under lease from the Western Union Telegraph Company, the corporation is planning to place its own satellite in operation in the near future. ASC's capabilities include the handling of business telephone circuits, voiceband data circuits, wideband digital circuits, digital and analog facsimile, and television. [Ref. 17, p. 60].

c. Western Union Telegraph Company

The WESTAR I and II communications satellites of Western Union were the first commercial satellites to be wholly owned and operated by a domestic communications company. The third WESTAR satellite is held in reserve and ready for launch by NASA should the need arise. Each of these units have a capacity of 800,000,000 literal words/second. The Western Union system operates 5 earth stations and is completely integrated with the WU ground facilities and with the ground facilities of the other carriers. [Ref. 17, p. 70].

3. Broadcast Facilities

The most important facet of the broadcast industry in the U.S. is its ability to reach virtually all Americans. Geographically the entire Nation is covered and access to a radio or television receiver is possible for almost every person. Over 95% of all U.S. households possess one or more radios or TV sets. [Ref. 2, p. 74]. According to FCC statistics at the beginning of 1973 there were 11,235 operating AM, FM, and TV stations in the country as follows:

Commercial AM	4,392
Commercial FM	2,447
Educational FM	599
UHF Commercial TV	193
VHF Commercial TV	512
TV Translators and boosters	2,864
UHF Educational TV	136
VHF Educational TV	92
Total	11,235

[Ref. 13, p. 194]

Broadcast radio has been a growing and vital industry since the early 1920's, but with the authorization of TV in 1952 the growth of broadcast facilities has been enormous. For example, in the period 1950-1970 the number of TV sets in the U.S. went from 13 million to 93 million. [Ref. 2, p. 74]

Aside from the obvious benefits derived from these facilities such as entertainment, news coverage, weather information, and the employment of hundreds of thousands of persons, the industry provides the government with an almost instantaneous method for public coordination, direction, and information distribution during national crisis or emergency.

D. GOVERNMENTAL DEPENDENCY ON COMMERCIAL COMMUNICATIONS

The role of commercial communications in national emergency preparedness is defined to a great degree by the extent to which the Federal Government is dependent on commercial assets on a day-to-day basis for the successful accomplishment of routine communications tasks. The most important factor in any mobilization effort involving communications will be time, especially if the nature of the emergency is imminent or actual attack. The rapidity with which maximum utilization of commercial communications resources can be achieved will vary directly with the degree of utilization already inherent in routine communications operations. In this regard the Federal Government is in an admirable position due to the heavy reliance already placed on commercial communications carriers and their assets.

This section will examine the current policy, trend, and some relevant statistics concerning this dependency, including an area of total dependency, the Emergency Broadcast System.

1. Policy and Trend

It is the general policy of the Federal Government to rely on the private enterprise system to supply its needs. The Office of Management and Budget Circular No. A-76, from which this general policy statement comes, is the basis for all government procurement and leasing of commercial communications services and products.

The significant policy-setting area of the Circular is the setting forth of the circumstances and criteria by which the government may function as the profider of a product or service for its own use. In other words, the circumstances under which commercial acquisition is not authorized. These include:

1. Procurement of a product or service from a commercial source would disrupt or materially delay an agency's program.
2. It is necessary for the government to conduct a commercial or industrial activity for purposes of combat support or for individual and unit retraining of military personnel or to maintain or strengthen mobilization readiness.
3. A satisfactory commercial source is not available and and cannot be developed in time to provide a product or service when it is needed.
4. The product or service is available from another Federal Agency.

5. Procurement of the product or service from a commercial source will result in higher cost to the government. [Ref. 19, p. 2-3].

Policy in this area was reinforced in 1974 with the issuance of OTP Circular No. 13, Federal Use of Commercial Telecommunications Services. This policy circular emphasizes and clarifies the long-standing national policy of reliance on the private sector for telecommunications services and facilities. [Ref. 12, p. 11]. Also included in this circular was the establishment of policy favoring the direct purchase of commercial services, which has the distinct advantage from the government's point of view of placing the burden for system design, engineering, management, operation, and maintenance and logistic support to the commercial supplier. Under Circular 13 the Federal Government will function as the "provider" of communications services only if the needed service or equipment is unavailable from private sources when it is needed or when one of the restrictive circumstances of OMB Circular A-76 applies. [Ref. 12, p. 14].

Early policy concerning governmental use of commercial assets was established by the Department of Defense in a policy statement to the President's Communications Policy Board in 1950:

"Within the limits of the continental United States, the Military Services, in establishing communications networks for the purpose of interconnecting their various headquarters, installations, and activities,

will, by lease or other contractual arrangement, utilize commercial facilities and services when available and feasible except where unusual security or operational conditions are required." [Ref. 20, p. 228].

As might be expected the trend of governmental reliance on commercial communications has been one of ever-increasing magnitude. Commercial communications continue to provide the reliability, flexibility, technological expertise, and cost effectiveness needed in this modern era of rapid response times and inflationary price tags. This trend is clearly evident in any analysis of projected government expenditures for communications services. Figure 7 contains budget estimates and data for the present period and projected estimates for the period 1980-1985.

This trend has resulted in a state of governmental dependency that would be impossible to reverse or eliminate, even if that was the desired course of action. Within DCS, for example, which is the largest entity within the NCS, over 56% of the total system is leased from commercial carriers. Over 99% of the private line, intercity circuits in the U.S. used by DCS are leased. These circuits alone stretch over 12,000,000 circuit miles. In addition, over 1,000,000 miles of transoceanic circuits of the DCS are leased. DCS alone averages over $500 million annually in leasing expenses. [Ref. 21]

The primary automated voice network of the NCS, AUTOVON, links almost 1,000,000 government telephones, each capable of reaching any commercial telephone in the country. The network has 75

BUDGET STATISTICS

[Ref. 16]

1980-1985 ESTIMATED ANNUAL GOVERNMENT TELECOMMUNICATIONS PROCUREMENT EXPENDITURES
(in millions of 1975 $)

	Est. Annual Expenditures	Five Year Growth (1%)
Common User Voice Circuits and Services	$ 430	28
Dedicated Private Line Voice Circuits and Services	80	23
Commercial Toll and Local Telephone Service	250	25
Leased Common User Data and Record Circuits and Services	115	28
Dedicated Data Systems	270	50
Commercial Teletype and Other Record Communications	35	40
Equipment Procurement, Lease, Installation, Operation and Maintenance	675	25
	$1,855	28

1975-80 U.S. GOVERNMENT TELECOMMUNICATIONS ANNUAL EXPENDITURES

	($ Millions)
Common User Voice Circuits and Services	$ 350
Dedicated, Private Line Voice Circuits and Services	65
Commercial Toll and Local Telephone Service	200
Leased, Common User Data and Record Circuits and Services	90
Dedicated Data Systems	180
Commercial Teletype and Other Record Communications	25
Equipment Procurement, Lease, Installation, Operation and Maintenance	540
	$ 1,450

Figure 7

GENERAL SERVICES ADMINISTRATION
FEDERAL TELECOMMUNICATIONS SYSTEM,
VOICE PROGRAM BUDGETS
(Expenditures in Millions of Dollars)

	Fiscal Year 1974	Fiscal Year 1975	Fiscal Year 1976	Fiscal Year 1977
Local Service	88.0	95.4	110.1	119.2
Intercity and Extended Service	126.9	148.4	171.2	185.3
Total	214.9	243.8	281.3	304.5
Estimated Telephone Lines, Equipment and Service Portion				
Local Service	74.0	80.2	92.6	100.2
Intercity and Extended Service	120.1	130.0	145.0	165.3
	194.1	210.2	257.6	265.5

Figure 7

automatic switches, 16,350 subscribers, and operates over 5,000,000 circuit miles. All facilities comprising this system are leased. Other major automated networks such as AUTODIN and AUTOSEVOCOM are also composed almost entirely of leased commercial assets. [Ref. 10, p. 14].

Although the Federal Government is firmly committed to its own system of communications satellites such as the Defense Satellite Communications System (DSCS) and Fleet Satellite Communications System (FLTSATCOM), there now exists solid dependence on the commercial satellite systems now in operation. The annual cost paid to INTELSAT in the Pacific area alone in 1975 was over $19 million. [Ref. 5, p. 43].

A recent study by the Defense Communications Engineering Center concerning the feasibility of increased governmental dependency on commercial satellite systems to satisfy DOD requirements concluded that the most efficient and cost effective method for meeting these requirements was a proper mix of both commercial and government owned satellite systems. [Ref. 5, p. 73]

Submarine cable connecting the U.S. with other land masses has been a primary means of long-haul communications for many years. Although the satellite systems have taken over a good portion of the load from these cable circuits, it should be noted that these circuits are more survivable, are cheaper to operate, and are more reliable

in the long run. Submarine cable communications play a vital role in government communications and are totally owned and operated by commercial enterprises.

2. The Emergency Broadcast System (EBS)

In meeting its responsibility for the development of emergency communications systems, the FCC and NIAC in conjunction with other government planning agencies put together the Emergency Broadcast System in 1972. The EBS is an emergency system for all states and territories developed to be used during national crisis, emergencies, or war. Broadcast stations participate in the EBS on a voluntary basis.

At the national level the EBS is designed to respond to a presidential request for service within 5 minutes. According to the OTP, "the national level EBS provides the President of the U.S. with a readily available, reliable, and low cost means of emergency communications with the American people." [Ref. 22].

The wire service network of the Associated Press and the United Press are the instruments through which the affiliated radio subscribers receive the Emergency Action Notification (EAN). These subscribers represent about 50% of the approximately 7000 U.S. broadcast stations which participate in the EBS. In addition to notification of AP and UPI, the control facilities of A. T. & T. are also utilized to configure the special EBS network, which initiate broadcast station notification and prepare the necessary circuitry for whatever location or broadcast action the President may require.

All EBS stations are required to maintain the necessary equipment to receive the EAN by off-the-air monitoring of designated stations and are required to conduct an on-the-air test at least once a week.

Of the over 7000 licensed broadcast stations within the EBS, 4200 are AM radio stations providing basic coverage for the system, 2800 FM stations providing interconnecting relay coverage, and about 900 television stations as augmentation assets. National Public Radio and the Public Broadcasting Service participation in the EBS was approved in 1972 and the assets of these two systems now participate fully in the EBS tests and activities. [Ref. 13, p. 178-179].

III. CONCLUSIONS/RECOMMENDATIONS

A. CONCLUSIONS

Regarding the legislation providing the legal basis for governmental authority over commercial communications, it is concluded that:

1. Current legislation is outmoded and has had to be continuously amended and updated in order to provide the necessary legal authority for government action.
2. The last all-encompassing legislation concerning communications was passed in 1934, the Federal Communications Act of 1934.
3. Presidents have had to rely on executive orders citing various laws not necessarily dealing with communications as the basis for initiating needed reorganization within government in order to obtain more efficient and responsive communications.

In the area of planning the emergency preparedness planning machinery of government involving telecommunications is scattered among too many agencies and organizations, resulting in redundancy and duplication of effort, and is too broad and general in nature and scope.

Other specific conclusions are as follows:

1. The communications industry in the U.S. has grown faster than the Federal Government's ability and authority to properly utilize and mobilize it for emergency use.

2. Based on present emergency preparedness plans and government organizational structure, the importance of commercial communications assets as a vital national resource is not being fully recognized.

3. The Federal Government's reliance on commercial assets for the accomplishment of routine and emergency communications is extremely heavy.

4. The trend of this reliance is that it will continue to increase.

B. RECOMMENDATIONS

Based on the above conclusions the author recommends the following actions be taken:

1. The Congress should enact necessary legislation for the purpose of updating the government/communications industry relationship as it exists today and as it is likely to progress in the future based upon the present trends.

2. New legislation encompassing the special role of commercial communications with respect to the government's utilization of these assets during crisis periods should be enacted.

3. Government agencies and organizations currently involved in emergency preparedness planning should be consolidated and streamlined under one central planning organization.

4. More involvement by commercial communications management personnel in governmental planning should be fostered.

5. A system for the monitoring and testing of commercial communications enterprises performance under emergency conditions should be initiated.

6. Lastly, it is time that the proper degree of importance be placed on the role of commercial communications in the emergency preparedness of the Nation by creating a cabinet post and department of government be involved full time with the problems connected with proper utilization, mobilization, and regulation of the national resource of communications.

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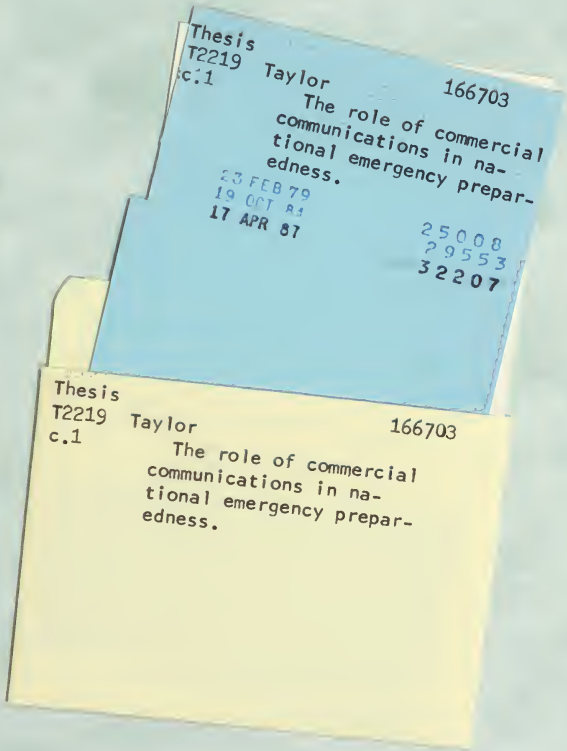

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